Due to poverty and high rates of unemployment, people in urban areas may resort to agriculture. For some of them, this is a practice they were accustomed to before migrating to urban areas, for instance women who were used to participating in community gardens in the rural areas. The production of food helps to alleviate poverty caused by HIV/AIDS, which has left many families, in particular women and children, without income.

A number of governmental and non-governmental organisations have put urban food security at the centre of their development strategies (1). In 2004, the African Roots Project was formed out of the recognition that good nutrition is the most important requirement for good health, particularly for people affected by HIV/AIDS. The project, which ran through 2005, was a partnership between the Children in Distress Network (CINDI), the Institute of Natural Resources (INR) and the Msunduzi Municipality. It also included the University of KwaZulu-Natal, and local and provincial government departments, e.g. Agriculture, Health and Education.

The aims of the African Roots Project were to address food insecurity and the nutritional needs of poor urban communities affected by HIV/AIDS through the propagation of indigenous plants and the coordination of food garden initiatives in the Msunduzi Municipality.

Wild edible plants were identified as crops that can assist in ensuring food security, nutrition and ultimately good health. Such crops require less intense care, can be grown organically, are fast growing, and are harder than many other conventional crops. They also contain many of the micronutrients required for good health, usually at concentrations greater than conventional crops.

The African Roots Project developed a strategy to increase the variety of nutritious plants cultivated by a large number of affected urban households (Njokwe and McCosh, 2005). The following activities were implemented during the first phase of the project:

**Strategic planning workshop**
Identified stakeholder groups, partners and community gardeners were invited to a workshop to develop a strategy for the implementation of the indigenous vegetable project. They set out the project's aims, objectives and activities.

**Situation analysis**
In 2004, a survey was conducted on the prevalence and contribution of indigenous vegetables to the family diets of households in the city of Msunduzi. The survey sought to improve urban farmers’ understanding of their own consumption patterns, the diversity of crops that can be produced and their nutritional values. Twenty-eight different garden groups participated in this participatory assessment, e.g. community garden associations, groups organised around gardens at clinics, youth groups, support groups of people living with HIV/AIDS (PLWHA) and community-based organisations (CBOs).

The following activities were implemented during the second phase of the project:

**Identification of indigenous vegetables**
Indigenous vegetables were promoted as a supplement to conventional crops, particularly because of their high micronutrient content. The choice of crops to be promoted was based on their popularity as indicated in secondary information and in the survey. In Msunduzi (Njokwe, 2005) the following indigenous vegetables were selected for propagation: blackjack (Bidens pilosa), amaranth (Amaranth spp.), spiderweed (Gynandropsis gynandra), cowpeas (Vigna spp.), orange sweet potato (Ipomomea batatus), lambsquarter (Chenopodium album), calabash (Lagenaria spp), wild mustard, and quickweed (Galinsoga parviflora). These crops were chosen because they are common in the Msunduzi area, grow easily in cultivation and have a high nutritive value, particularly in micronutrients. These crops are also well known by both the young and older generations.
Bio-intensive gardening
At all sites in Msunduzi, demonstrations were conducted on bio-intensive gardening techniques such as trench beds, container gardens, raised beds and no-till systems. Organic farming was promoted to avoid the negative health and environmental impacts of agro-chemicals and poisons that cause problems for people with compromised immune systems and to save money that many of the target groups do not have.

Seed collection and propagation
Apart from amaranth and sweet potato, seeds of these indigenous vegetables were not available commercially. Therefore participants learned to collect their own seeds for propagation. They were trained in collection and competed with each other in seed collection workshops, in which prizes were awarded according to variety, quantity and quality of seed collected. The workshops also created an opportunity for the participants to share experiences in seed collection, which enhanced the knowledge of all participants. Demonstrations on the propagation of indigenous vegetable seeds were easily conducted in areas where miniature nurseries had been established. Youth groups and school children in particular liked to be involved in nurseries.

Nutrition training officer
A nutrition training officer, employed by CINDI, worked closely with the agricultural coordinator employed by the Institute of Natural Resources. This made it possible to take a more holistic approach to nutrition. Project participants were informed about the agronomic aspects of both conventional and traditional food production as well as the importance of nutrition and the four food groups. Demonstrations of appropriate methods of food preparation were conducted to ensure that maximum nutrients are retained in the food.

Promotion and upscaling
The project maintained close links to several government departments, (e.g. Agriculture, Education and Health) as well as to NGOs and CBOs in order to raise awareness of the benefits of indigenous vegetables within technical services in an effort to upscale the use of indigenous crops. Promotional activities were also undertaken during the above-mentioned activities, as such presentations on nutrition, health and indigenous vegetables, and the production of posters on nutrition, health and HIV/AIDS. An Indigenous Vegetable Awareness Day was organised, during which dieticians and other speakers talked about the role of indigenous vegetables in mitigating the effects of HIV and AIDS and in promoting good health in general. Farmers also displayed seeds they had collected. Demonstration sites on organic production of indigenous vegetables were developed in community gardens, local clinics, special and pre-primary schools, and Drop-in-Centres.

UKULINGA FARM / URBAN TO RURAL
The support that institutions and organisations such as the African Roots Project have been offering to the HIV affected and infected areas is widely recognised. Some provide implements and inputs, but in general support for production techniques is rather limited and inconsistent. Hence, most urban farmers still operate with inadequate implements, technical know-how, land, water and other agricultural inputs, yet they manage to adapt to the circumstances they face.

The Farmer Support Group (FSG) recognised the need to support innovation in urban agriculture. It developed a multi-pronged approach to address the need for information and innovation in urban agribusiness/gardening. This approach includes some of the strategies used by the African Roots pilot project.

FSG has many years of invaluable experience working with resource-poor and HIV/AIDS-affected people in the Msinga and Bergville rural areas. It uses approaches similar to the one piloted by the African Roots Project in Msunduzi Municipality. The main difference is that FSG promotes identification, action research and development of innovations by farmers in their fields. It conducts experiments on its own research farm, and promotes action research conducted by the farmers in their fields. FSG is a member of PROLINNOVA, a global coalition of organisations that promote participatory innovations development (PID).

The indigenous vegetables that are experimented with at Ukulungia Research and Experiment Farm were identified by both young and old, urban and rural farmers in Msinga (Njokwe and McCosh, 2005; Njokwe, 2006). The plots on the farm are used to create awareness and to research and demonstrate sustainable techniques for the production of specific indigenous vegetables. Its target group includes both urbanites who want to participate in urban farming and rural farmers who want to adopt, adapt and practice urban farming principles relevant to their rural situation. Through cross visits, farmers make their own assessments that lead to informed decision making.

LESSONS LEARNED
The involvement of multiple segments of the urban population, e.g., youth groups, People Living with HIV/AIDS (PLWHA), school children, clinic volunteers, traditional and elected leaders, in the promotion and production of indigenous crops should be supported by all stakeholder groups. Schools, clinics, churches and community centres should have food gardens on site, through which potential gardeners in the community can be taught, encouraged and mentored.

Partnerships should be developed with local and provincial governments, NGOs and CBOs to facilitate upscaling of the results. The Department of Health can offer clinic sites, educate its staff about the importance of indigenous crops and ensure that Community Health Workers and home-based care volunteers educate beneficiaries about the benefits of indigenous crops and encourage them to produce and eat indigenous crops. The Department of Agriculture can train its technicians on the value of indigenous crops and their production techniques and provide extension support services in upscaling the project. The Department of Education can include urban agriculture and the importance of indigenous crops in relation to HIV/AIDS in education material. The municipality and traditional leaders can allocate land for urban
The business is financially feasible if the bio-compost is sold at a price that is not lower than the break even price of 1.52 Birr (0.18 USD) considering opportunity costs and 0.85 Birr (0.10 USD) per kg without consideration of opportunity costs. Since IBE is a private limited company, any profit earned is reinvested.

**PROMOTION**

IBE promotes bio-compost organic fertiliser and urban waste management recycling in general in the following ways:

- By managing bio-compost marketing centres.
- By inviting officials of different government-mental and non-governmental organisations to visit the project.
- Through the media (advertisements) and publications including brochures, newsletters and posters.

The municipality also actively promotes urban agriculture and the use of bio-compost.

**CONCLUSIONS**

Waste management is a big issue in urban management, especially in mega cities like Addis Ababa. Land is scarce in these cities and it needs to be used productively and efficiently. Therefore, businesses that recycle organic wastes and produce standardised and packed organic fertilisers as described here are vital. They contribute to urban waste management but also indirectly to the promotion of safe agriculture in the city by providing organic fertiliser to urban farmers in small packs.

Agriculture is an important part (85%) of Ethiopia's economy and labour force. But, due to land degradation, agricultural production has become dependent on fertiliser application. As a result, Ethiopia imports vast amounts of inorganic fertiliser. Bio-compost thus has important potential in this country.

**References**


**Table 1. Cost-benefit of IBE**

<table>
<thead>
<tr>
<th>Items</th>
<th>Revenue/ Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Birr</td>
</tr>
<tr>
<td>Revenue (from sale of bio-compost)</td>
<td>539, 325</td>
</tr>
<tr>
<td>Labour</td>
<td>49, 746</td>
</tr>
<tr>
<td>Implements</td>
<td>15, 000</td>
</tr>
<tr>
<td>Soil nutrient analysis</td>
<td>4, 500</td>
</tr>
<tr>
<td>Packing costs</td>
<td>85, 440</td>
</tr>
<tr>
<td>Marketing costs</td>
<td>12, 000</td>
</tr>
<tr>
<td>Salary and administrative costs</td>
<td>48, 000</td>
</tr>
<tr>
<td>Others</td>
<td>12, 250</td>
</tr>
<tr>
<td>Opportunity costs</td>
<td>177, 200</td>
</tr>
<tr>
<td>Assembling at the market</td>
<td>14, 400</td>
</tr>
<tr>
<td>Loading</td>
<td>10, 800</td>
</tr>
<tr>
<td>Transport to project area and unloading</td>
<td>144, 000</td>
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<tr>
<td>Others</td>
<td>8, 000</td>
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<td>Total Cost (including opportunity costs)</td>
<td>404, 136</td>
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<tr>
<td>Total Cost (not including opportunity costs)</td>
<td>226, 936</td>
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<tr>
<td>Profit (including opportunity costs)</td>
<td>135, 189</td>
</tr>
<tr>
<td>Profit (not including opportunity costs)</td>
<td>312, 389</td>
</tr>
</tbody>
</table>

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The sharing of experiences and innovations between urban and rural farmers is important and efficient because rural farmers have knowledge that has been generated over many decades. For instance, the Msinga people have developed innovative ways to cook, process and mix indigenous vegetables in order to preserve them and balance nutrients in their diet (Njokwe, 2006). Rural areas have more wild varieties of indigenous vegetables than urban areas, which have fewer or no wild areas at all. On the other hand, urban farmers have invaluable experience on how to survive on very scarce resources with limited or no support, and they have access to markets. These and other lessons are being shared through the network of rural and urban farmers interacting through the FSG. The farmers’ evaluation reports showed that the yield of exotic and indigenous vegetable cultivated in trench and raised plots is very high. Production costs are low compared to the conventional farming system.

Through various experiments conducted together with farmers and at Ukulinga farm, FSG will further strengthen the exposure of urban and rural farmers to innovative techniques Eventually, a market development strategy will be adopted to allow the communities to raise income to meet some of their needs.

**Notes**

1) In Msunduzi, these institutions include CINDI Network, Institute of Natural Resources, Department of Health, Department of Social Welfare, Department of Agriculture, the Farmer Support Group (FSG) of the University of KwaZulu-Natal, and the School of Agricultural Science and Agribusiness of the same university.

**References**


